

GUIDELINES FOR DEVELOPMENT OF ACCESSIBLE E-LEARNING PLATFORMS

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Abstract: *Students with disability face a wide range of barriers, including access to information. Studies show that information and communication technologies provide a powerful tool in supporting education and inclusion in social and daily life of them. Unfortunately, there is a lack of available and appropriate accessible technologies. Also, developers often do not have the proper training and knowledge to make education technologies more accessible. In the paper we present most important guidelines for development of accessible web pages, like WCAG, WAI and european standards for accessibility requirements of ICT products and services in Europe. Additionally, example of the accessibility software for creating and evaluation of educational content is presented. The software enables beside creation of accessible content also management of educational process. At the end, evaluation of the software is presented, using freely available accessibility check tool.*

Key words: *eLearning platform, students with disabilities, accessibility, supporting education, WCAG, WAI*

1. INTRODUCTION

People/Students with disability (PwD/SwD) face a wide range of barriers in education. Some of them are: lack of accessibility integration, lack of quickly and readily information on available accessible technologies, developers do not have the proper training, tools and resources to implement accessibility, lack of support of state institutions and enterprises – shortcoming in improving accessibility and violation of the rights to communication and education [1].

2. WHAT IS ACCESSIBILITY

What does accessibility mean? A very important aspect of using programs and contents used by the Internet browser is the aspect of accessibility of data and the aspect of easily exchange and re-using of data. A person who has a reduced mobility of hands, fingers, hands or one hand, or a significantly reduced functionality of the hand should have the same ability to manage such programs as other people. The same rule applies to all types of disabilities, but also to cultural, gender and other characteristics [2]. Accessibility for various types of users as well as the

overcoming of technological barriers for the freedom of dissemination of educational material have to be incorporated from the beginning in the context of creating the skills for creating educational content in a digital environment. Data accessibility rules include technological and authoritative measures and procedures that allow the content to be adapted to various types of users.

Information and Communication Technologies (ICT) can be a powerful tool in supporting education and inclusion for PwD/SwD [3]. Through the learning technologies (ICT) an educational system was transformed because these technologies are available and accessible, especially for PwD/SwD.

3. ASSISTIVE TECHNOLOGY

Assistive technology (AT) is any item, piece of equipment, software program, or product system that is used to increase, maintain, or improve the functional capabilities of persons/students with disabilities. We will cover assistive technologies, with a special focus on accessible e-learning systems. An organization that

specifically addresses these issues in the education process is called Global Learning Consortium, and an organization that addresses these issues when it comes to creating websites and other Internet content is called the World Wide Web Consortium, the Web Accessibility Initiative. In order to make the learning process more successful for students with disabilities, access to the Internet is necessary.

3. ATUTOR

ATutor is a software for creating educational content, as well as the overall management of the educational process, Learning management System (LMS), which the scientists at the Adaptive Technology Resource Center at the University of Toronto, Canada, created [4].

ATutor was created by making everything according to accessibility criteria for PwD/SwD. In this way, PwD/SwD can be educated by attending courses in electronic form, and courses are created according to international standards for accessibility of attending a course. The interface of the ATutor program was translated into Serbian, a detailed manual in Serbian was written. The application of such free software can significantly improve the education of PwD/SwD, especially bearing in mind that a large number of PwD/SwD are deprived of education, because they are not adapted for higher, high and often high school education. Initiatives that would allow the use of such free software in regular education as well as in adult education could have significant economic and social results because the majority of the members are adult learners.

4. ATUTOR ACCESSIBILITY EVALUATION

The Web Accessibility Initiative (WAI) of the Worldwide Web Consortium (W3C) has developed a methodology that can provide an informative evaluation framework [5] named “The Website Accessibility Conformance Evaluation Methodology (WCAG-EM) 1.0.” It breaks the evaluation procedure into five steps.

They are

- Define the Evaluation Scope,
- Explore the Target Website,
- Select a Representative Sample,
- Audit the Selected Sample, and
- Report the Evaluation Findings.

The first three steps in this methodology involve preparing for the evaluation. Defining the scope entails specifying areas within a site that will be included or excluded in the evaluation (e.g., subdomains, mobile versions, additional domain names, third-party content), identifying a standard or target (e.g., WCAG 2.0 Level AA), and listing supported browsers and assistive technologies. Next, explore the site and identify common templates or page types, essential areas or functionality, and any out-of-the ordinary technologies that should be included in the evaluation. Pages that are relevant to people with disabilities (e.g., a page outlining

accessibility features) should also be included.

In order to evaluate Web Accessibility of the web sites and web applications we used tools recommended by WebAim (<https://webaim.org/>) WAVE. WAVE is a free online tool from WebAIM that can help users identify accessibility issues on a page-by-page basis. It does this by inserting color-coded icons that identify accessibility issues, potential issues, and potential features that must be verified by the reviewer. [6].

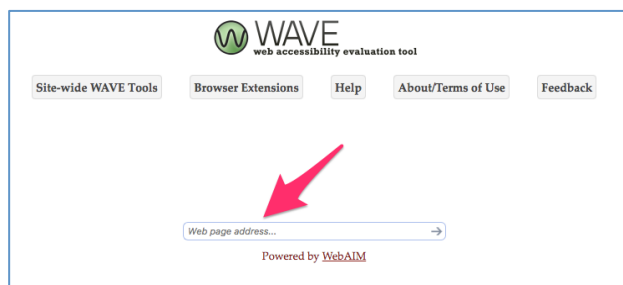


Image 1: First page of the WAVE Tool

In order to analyse web accessibility of the ATutor, we tested available DEMO site of the ATutor LMS - <http://www.atutor.ca/atutor/demo.php> We entered the web address of the demo web site in the WAVE APP and reviewed the report.

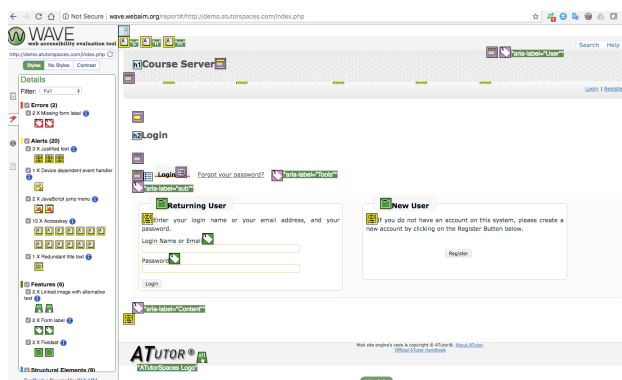


Image 2: ATutor Accessibility WAVE results

In the left menu WAVE app showed us the report which could be further analyzed. Contrast test showed many errors. This brought to conclusion that the GUI (graphical user interface) of the ATutor LMS should be improved in terms of color coding and contrast. Other marks showed good accessibility results.

5. CONCLUSION

It is very important for educational institutions to use available tools for accessibility testing. Free web tools exist and they should be used continuously. The problem is that educational organizations have competing priorities and often have to deal with shrinking budgets. For web accessibility to raise to the level of action for many educational organizations the problem must be well understood by those who will make decisions. As these individuals change, this critical component will need to be revisited. [6]

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